Very Severe Hypertriglyceridemia Prior to CABG: Successful Preparation and Sustainable Triglycerides Level

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Objective

To manage very severe refractory hypertriglyceridemia right prior to CABG surgery and maintain optimal levels postoperatively.

Background

Very severe hypertriglyceridemia is reported at TG levels > 1000 mg/dL. Besides the known risk of acute pancreatitis, TG are an independent risk factor for CAD and are associated with a hypercoagulable state. This poses a life threatening risk of hypercoagulability, thrombosis and postoperative complications following coronary artery bypass surgery (CABG). Hypertriglyceridemia is also associated with increased mortality and reduced event-free survival after CABG. A thorough review of the literature did not reveal any cases where there was administration of IV insulin preoperatively for TG lowering in a patient not having acute pancreatitis and planned for a major surgery (i.e CABG).

Case Presentation

67 year old Caucasian female

Long history of very severe hypertriglyceridemia
- Uncontrolled type 2 DM
- Active CAD, s/p PTCA and stenting, in need for CABG.
- Nonsmoker, and had very minimal alcohol intake.
- The physical exam was negative for skin eruptions or tendinous xanthomas. BMI was 21 kg/m².

History of the Hypertriglyceridemia:
- Diagnosed at the age of 30
- Negative family history of inherited lipid disorders
- Despite treatment with fibrates + statins, compliance and adherence to a strictly low fat diet, TG level remained between 3000 and 8000 mg/dL
- Was having 2-3 episodes of pancreatitis yearly

2 weeks prior to CABG surgery:
TG 2201 mg/dL, total cholesterol 344 mg/dL, LDL-C 28 mg/dL, HDL 26 mg/dL, despite treatment with maximal dose of fibrate, statin, Omega-3 fish oil and basal-bolus insulin regimen for diabetes control.

3 days prior to CABG surgery:
- TG level was 1219 mg/dL
- Normal amylase and lipase levels, no clinical or biochemical evidence of acute pancreatitis.
- Plasmapheresis unavailable on site

Hospital Course:
- Patient was hospitalized 3 days pre-operatively, kept NPO and IV insulin was administered along with IV dextrose to maintain euglycemia in the setting of continuous use of IV insulin for its TG lowering effect.
- On the day of surgery, the TG level was 196 mg/dL.
- Successful CABG surgery, uneventful post-op course.
- TG level upon discharge was 707 mg/dL. It remained below 500 mg/dL 4 months later.

Possible Atherogenic Changes Accompanying Hypertriglyceridemia

Increased VLDL cholesterol-rich remnants
Low HDL
Small, dense LDL
Increased chylomicron remnants

Coagulation changes

Results

<table>
<thead>
<tr>
<th>D-4</th>
<th>D-3</th>
<th>D-2</th>
<th>D-1</th>
<th>CABG</th>
<th>D+1</th>
<th>D+2</th>
<th>D+3</th>
</tr>
</thead>
<tbody>
<tr>
<td>TG (mg/dL)</td>
<td>2201</td>
<td>1219</td>
<td>586</td>
<td>271</td>
<td>196</td>
<td>375</td>
<td>470</td>
</tr>
<tr>
<td>HDL (mg/dL)</td>
<td>26</td>
<td>22</td>
<td>26</td>
<td>17</td>
<td>15</td>
<td>17</td>
<td>19</td>
</tr>
<tr>
<td>LDL (mg/dL)</td>
<td>28</td>
<td>47</td>
<td>124</td>
<td>85</td>
<td>43</td>
<td>46</td>
<td>34</td>
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<tr>
<td>Total Chol (mg/dL)</td>
<td>344</td>
<td>267</td>
<td>156</td>
<td>133</td>
<td>157</td>
<td>194</td>
<td></td>
</tr>
</tbody>
</table>

Conclusion

Challenge → Rapid lowering of the TG level from 1219 mg/dL to < 300 mg/dL 72 hours prior to a high risk surgery (i.e CABG).

Uniqueness → Severe resistant hypertriglyceridemia without clinical or biochemical evidence of acute pancreatitis to require IV insulin infusion as it would be traditionally indicated.

Success → Lowering TG level preoperatively, having an uneventful surgical course, and improving the patient’s lipid profile sustainably.

Future → Our case is a reportable intervention in patients with very severe resistant hypertriglyceridemia.